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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,060	01/15/2002	Mutsumi Kimura	111668	2963
25944	7590	03/15/2004	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,060

Applicant(s)

KIMURA, MUTSUMI

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-24 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,10-24 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/19/02;12/10/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities:

In claim 1, line 6, recitation "... is controlled ..." should be - - "... are controlled ... - -". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 23 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, recitation "an electro-optical device comprising a plurality of signal lines; and a plurality of pixels, each pixel including: an electroluminescence element and a liquid crystal element, wherein light emission of the electroluminescence element and light reflection through the liquid crystal element are controlled according to a signal supplied through a signal line of the plurality of signal lines", that is not definite. Because the claimed language cannot tell the structure's relationship, such as an electro-optical device must have more detail structures to describe the configuration of the device how to make the device. Such as according to the Fig.1, the device must have substrates, electrodes, and various signal lines, etc., and the limitations should describe where the light comes from and where the light emits to, and the limitations should describe where

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the light reflects from and where is the light reflector, and the limitations should describe how to control the electroluminescence element and the liquid crystal element, and specifically describe how to use the electroluminescence element or the liquid crystal element being selectively controlled for the light modulation (for the image display), and specifically point out the invented subject matter.

Claims 23 and 28, recitation “. . . selectively driving the electroluminescence element and liquid crystal element for display images” and “. . . wherein the first electro-optical element and the second electro-optical element are selectively driven to display images” are not definite. Because the limitations cannot tell how to selectively driving the electroluminescence element and liquid crystal element for display images, and any electro-optical display must be selectively driven so as to display image. The claims must completely describe the driving method and the driving structures, and specifically point out the invented subject matter.

Claim 24, recitation “. . . wherein the electroluminescence element and liquid crystal element are selected to be driven according to a condition at which the electro-optical device is used” is not definite, because there is an electro-optical device in the claim 23, and that would be inconsistency with the claim 24 there seems to have more than one electro-optical device.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 10, 17, 23-24 and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,025,894 (Shirasaki et al).

Claims 1-2, 10 and 17, Shirasaki discloses (col.7, line 17 – col. 17, line 4; Fig.1)

a display apparatus (11), i.e., an electro-optical device, comprising :

- a plurality of signal lines, such as the gate electrodes of the TFTs (31) are connected to gate lines through which select voltages are applied; the drain electrodes of the TFTs (31) are connected to drain lines through which signal voltages are applied;
- a plurality of pixels and each pixel including:
- an electroluminescence element (EL) (12) and a liquid crystal element (22); and the light emission (such as the light z) and the light reflection (such the light y) are controlled according to a signal supplied through signal line applied to the anode electrode (19), cathode electrode (15) and pixel electrode (30) and common electrode (25); therefore, under a bright environment, the organic EL (12) is disabled; and under a dark environment, the organic EL (12) is activated;
- switching element (TFTs) (34) that is controlled to be in ON state or OFF state by selecting voltages applied.

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Claims 23-24 and 28-29, Shirasaki discloses (col.7, line 17 – col. 17, line 4; Fig.1) a display apparatus (11), i.e., an electro-optical device, comprising: a plurality of pixels, and each pixel comprising an electroluminescence element (12) and a liquid crystal element (22), and according to the condition of use in bright environment or use in dark environment, selectively driving the electroluminescence element (12) is disabled or is activated, and selectively driving the liquid crystal cell, i.e., different pixels, so as to display image. According to the claim 28, the first and the second electro-optical element can be any kind of electro-optical element, even the different pixels, and in order to display image, the different pixels selectively to be driven.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5-7, 11-16, 19-22 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki as applied to claims 1-2, 10, 17, 23-24 and 28-29 above, and further in view of US 2002/0158823 (Zavracky et al), US 6,133,976 (kimura) and US 5,610,628 (Yamamoto et al).

Claim 5, Shirasaki does not expressly disclose the switching element controlling the electroluminescence element or the liquid crystal element.

However, Zavracky discloses (col.1, paragraph 0004) when a particular pixel of the display turned on by TFTs, the liquid crystal material rotates polarized light being transmitted through the material so that the light will pass through the second polarizing filter. That is a basic principle using TFTs to control the light passing through the liquid crystal material and to display the image, and that would have been at least obvious for obtaining an image display.

Claim 6, Shirasaki discloses (col.1, lines 18 – 43) that the LCD can be reflective LCD. Because the reflective LCD uses in the daylight with bright outside light (in a bright environment) can obtain good contrast display and suppress power consumption.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use reflective liquid crystal as claimed in claim 6 for obtaining good contrast display and suppress power consumption.

Claim 21, Shirasaki does not expressly disclose the liquid crystal being a super twisted nematic liquid crystal having a twist angle of 180 degree or more.

However, Yamamoto discloses (col.2, lines 7-18) that an STN (super twisted nematic) LCD is generally used for achieving the sharpness of the display (high contrast), and in the STN LCD, the liquid crystal molecules are twisted through an angle of 180 to 270 degree.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use super twisted nematic liquid crystal having a twist angle of 180 degree or more as claimed in claim 21 for achieving a high contrast display.

Claim 7, Shirasaki discloses (col.13, line 64 – col.14, line 3) that in a dark environment there is insufficient amount of outside light, the organic EL device (12) is activated to be in a luminescent state. Therefore, the luminance of the electroluminescence element (EL) is controlled in a dark place. Shirasaki discloses (col.13, lines 2-24) that under a bright environment which provides a sufficient amount of outside light, the organic EL device (12) is disabled to be in a non-luminescent state, and the linearly polarized light is polarized in accordance with the voltage applied between the electrodes (25) and (30) by the birefringence effect of the liquid crystal (22). Therefore, the luminance of the liquid crystal element is controlled in a bright place.

Claims 11-13, Shirasaki discloses (Fig.1) that each pixel having organic EL (12) element and liquid crystal (22) element, so that each sub-pixel would also have organic EL element and liquid crystal element. Each pixel includes sub-pixels that was common and known in the art as the color display having sub-pixels (R,G,B) for the color image display. Shirasaki also discloses (Fig.1) that using switching element such as TFTs (34) being controlled to be in ON state or OFF state by the scanning signal, and the gray level must be corresponding to an average luminance of the pixel. Because the gray level is a signal level representation of an image data, and that would be converted in the digital processing, and that would have been at least obvious for achieving signal processing being controlled in the ON state or OFF state.

Claims 14-16, Shirasaki lacking is the limitation such that to use RAM in pixel. However, Kimura discloses (col.20, lines 33-35) that the picture element circuit

can be a circuit having memory functions such as an SRAM. Therefore, each pixel would include a static RAM and the video signal can be held in the RAM circuit, and inherently, the scanning only need to be performed when the displayed data (the video signal) is changed, because the video signal was held in the RAM, such that the display would save more power consumption. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange each pixel having a static RAM as claimed in claims 14-15 for achieving the result of scanning being performed only when the displayed data changed and save more power consumption.

Claims 19-20, Shirasaki discloses (col.4, lines 23 – 35; col.7, line 44 –col.11, line 49) that the EL material is a organic polymer material such as a mixture of poly (N-vinylcarbazole, etc., and such organic EL material can be formed very thin and emit light of sufficient luminance with a relatively low applied voltage.

Claim 22, the limitation is only given weight as intended use. Because any electro-optical device can be used as a display unit.

Claims 26-27, Shirasaki lacking is the limitation such that a device provides a signal to set a usage condition for the liquid crystal element and the organic EL element.

However, Kimura discloses (col. 20, line 46 – col.21, line 14; Fig.35) that a method of driving an electro-optical device in which using a selection pulse of a row selection signal (V_g), information of a "1" level or a "0" level is written from an information signal V_d into TR1 of an MOS-FET, such that if the information signal is '1' level, the device TR2 goes to conducting state, then the EL layer (70) goes to conducting state, so that the EL layer emits light; and if the information signal is '0'

level, the device TR2 goes to non-conducting state, then the EL layer (70) goes to non-conducting state, so that the EL layer does not emits light.

Since Kimura discloses that the light intensity signal as '1' level or '0' level and setting the EL layer a usage condition to emit light or not to emit light, and using switching device such as TR1 and TR2 to provide the information signal so as to set the usage condition for the EL element, such that the electronic apparatus using such control method and control device would reduce the power consumption and light usage more efficiently between the dark environment and the bright environment.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use such switching control device as claimed in claims 26-27 for reducing the power consumption and light usage more efficiently.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki as applied to claims 1-2, 10, 17, 23-24 and 28-29 above, and further in view of US 6,162,667 (Funai et al).

Claim 18, Shirasaki does not expressly disclose the TFT being polycrystalline silicon produced by a low-temperature process of 600°C or less.

However, Funai discloses (col.18, lines 18-29) that by using a polycrystalline silicon film forming of high performance TFTs having a high mobility and a high ON/OFF ratio can be realized with a low-temperature process such as 550°C.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use polycrystalline silicon forming TFTs by a low-temperature process as claimed in claim 18 for obtaining a high performance TFTs.

Allowable Subject Matter

9. Claim 3 is allowed.

10. Claims 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches an electro-optical device comprising various elements as claimed, more specifically, as the following:

both of the electroluminescence element (EL) layer and the liquid crystal element (LC) layer being placed above the switching element layer, and the liquid crystal element being placed above the electroluminescence element layer [claim 3, as shown in Fig.1];

one electrode of the electroluminescence element (EL) and one electrode of the liquid crystal display element (LCD) being common, i.e., the EL element and the LCD element share one electrode such as the pixel electrode (23) [claim 8, as shown in Fig.1];

the other electrode of the electroluminescence element (EL) and a reflector of the liquid crystal display element (LCD) being common, i.e., the EL element and the LCD element share one electrode such as the underlayer electrode (23) made of reflective metal [claim 9, as shown in Fig.1].

The closest references such as US 6,025,894 (Shirasaki et al) and US 6,133,976 (kimura) disclose an electro-optical device comprising electroluminescence element, liquid crystal element and switching element, but the prior art of record do not disclose such electro-optical device having both of electroluminescence element (EL) and liquid crystal element(LC) located above the switching element, and the EL element share the electrodes with the liquid crystal element (LC) as shown in Fig.1.

Response to Arguments

12. Applicant's arguments filed Dec.16, 2003 have been fully considered but they are not persuasive.

Applicant's arguments are as follows:

1) The references do not disclose using electroluminescence as a display element of a pixel.

Examiner's responses to Applicant's arguments are as follows:

1) In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the claimed language is too broad and the claims do not give a specific description about the structure of the electro-optical device, especially the arrangement of the electroluminescence element and the liquid crystal element and using them as a display element of a pixel) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, the reference Kimura also discloses (such as Fig.36) using electroluminescence (85) is utilized for light modulation (image display).

Conclusion

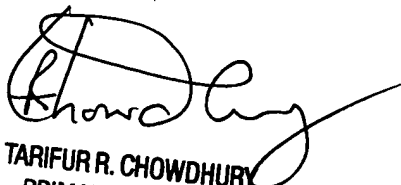
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
March 4, 2004


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER